

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

| | | |
|--|--|--|
| Applicant's or agent's file reference PCT117JST | FOR FURTHER ACTION | See Form PCT/IPEA/416 |
| International application No. PCT/JP2005/002185 | International filing date (<i>day/month/year</i>) 08.02.2005 | Priority date (<i>day/month/year</i>) 13.02.2004 |
| International Patent Classification (IPC) or national classification and IPC H01F10/16(2006.01), G11B5/39(2006.01), H01F10/32(2006.01), H01F41/22(2006.01), H01L21/8246(2006.01), H01L27/105(2006.01), | | |
| Applicant JAPAN SCIENCE AND TECHNOLOGY AGENCY | | |

| | | |
|--|-----------------------------------|--|
| 1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. | | |
| 2. This REPORT consists of a total of 6 sheets, including this cover sheet. | | |
| 3. This report is also accompanied by ANNEXES, comprising: a. <input type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of _____ sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). | | |
| 4. This report contains indications relating to the following items: <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application | | |
| Date of submission of the demand | Date of completion of this report | |
| Name and mailing address of the IPEA/JP | Authorized officer | |
| Facsimile No. | Telephone No. | |

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/002185

Box No. I

Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-4, 8, 19, 20 as originally filed/furnished
- pages* 5, 5/1, 6, 6/1, 7, 9 received by this Authority on 13 September 2005
- pages* _____ received by this Authority on _____
- ☒ the claims:
- nos. 2-6, 9-11, 13, 16-18 as originally filed/furnished
- nos.* _____ as amended (together with any statement) under Article 19
- nos.* 1, 7, 8, 12, 14, 15, 19 received by this Authority on 13 September 2005
- nos.* _____ received by this Authority on _____
- ☒ the drawings:
- sheets Fig. 1-12 as originally filed/furnished
- sheets* _____ received by this Authority on _____
- sheets* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2005/002185

| Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | | | | | | | | | | | | | | | | | | | | | |
|---|---|-------------|-------------|-------------|-----|--------|---------|----|---------------------|--------|---------|-----|--------|-------------|----|-------------------------------|--------|-------------|-----|--------|---------|----|
| 1. Statement | <table><tbody><tr><td rowspan="2">Novelty (N)</td><td>Claims</td><td><u>1-34</u></td><td>YES</td></tr><tr><td>Claims</td><td><u></u></td><td>NO</td></tr><tr><td rowspan="2">Inventive step (IS)</td><td>Claims</td><td><u></u></td><td>YES</td></tr><tr><td>Claims</td><td><u>1-34</u></td><td>NO</td></tr><tr><td rowspan="2">Industrial applicability (IA)</td><td>Claims</td><td><u>1-34</u></td><td>YES</td></tr><tr><td>Claims</td><td><u></u></td><td>NO</td></tr></tbody></table> | Novelty (N) | Claims | <u>1-34</u> | YES | Claims | <u></u> | NO | Inventive step (IS) | Claims | <u></u> | YES | Claims | <u>1-34</u> | NO | Industrial applicability (IA) | Claims | <u>1-34</u> | YES | Claims | <u></u> | NO |
| Novelty (N) | Claims | | <u>1-34</u> | YES | | | | | | | | | | | | | | | | | | |
| | Claims | <u></u> | NO | | | | | | | | | | | | | | | | | | | |
| Inventive step (IS) | Claims | <u></u> | YES | | | | | | | | | | | | | | | | | | | |
| | Claims | <u>1-34</u> | NO | | | | | | | | | | | | | | | | | | | |
| Industrial applicability (IA) | Claims | <u>1-34</u> | YES | | | | | | | | | | | | | | | | | | | |
| | Claims | <u></u> | NO | | | | | | | | | | | | | | | | | | | |
| 2. Citations and explanations (Rule 70.7) | <p>Document 1: JP 08-250366 A (Toshiba Corporation), 27 September 1996, entire text; all drawings</p> <p>Document 2: JP 2003-218428 A (Alps Electric Co., Ltd.), 31 July 2003, paragraphs [0069] and [0070]; fig. 2 & US 2003-137785 A</p> <p>Document 3: JP 07-147437 A (Toshiba Corporation), 6 June 1995, entire text</p> <p>Document 4: WO 02/069356 A (Claudia Felser), 6 September 2002, entire text & US 2004-114283 A & EP 1382046 A & CN 1526146 A & DE 10157172 A & DE 10108760 A</p> <p>Claims 1 to 3, 5 to 10, 12 to 17, 19 to 24, 26 to 31, 33 and 34</p> <p>Document 1 sets forth a Heusler alloy represented by the general formula X₂YZ, wherein copper, cobalt or the like is used as element X, manganese, iron or the like is used as element Y, and aluminum, gallium or the like is used as element Z; chromium, niobium, tantalum, iron or the like is used as the substrate of a Heusler alloy; a film is grown at a substrate temperature of room temperature or 150°; in prior art a thin film was formed using a Heusler alloy composition, and heated to around</p> | | | | | | | | | | | | | | | | | | | | | |

Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

250°; and a MgO (100) substrate is used.

Document 4 newly cited in the International Preliminary Report on Patentability sets forth a feature wherein $\text{Co}_2\text{Cr}_{0.6}\text{Fe}_{0.4}\text{Al}$ or $\text{Co}_2\text{Cr}_{0.6}\text{Fe}_{0.4}\text{Ga}$ or the like is used as a Heusler alloy represented by the general formula X_2YZ .

Document 2 sets forth a feature wherein the crystalline structure of a Co_2MnZ (where Z is one or more elements selected from aluminum, silicon, gallium, germanium or tin) Heusler alloy is an L2 structure.

In addition, in a Heusler alloy represented by general formula X_2YZ , it would be easy for a person skilled in the art to set the specific composition ratio of a Heusler alloy set forth in document 1 to the composition ratio set forth in document 4, and the crystalline structure is an L2 structure in the same way as the Heusler alloy set forth in document 2, therefore it would be easy for a person skilled in the art to conceive of said invention.

Claims 4, 11, 18, 25 and 32

Document 3 sets forth a feature wherein a Heusler alloy layer (2) represented by the general formula X_2MnZ is formed on an MgO (100) single crystal layer (1).

Moreover, in a Heusler alloy represented by the general formula X_2YZ , it would be easy for a person skilled in the art to conceive of applying the inventions set forth in documents 2 and 4 as an alternative to the MgO (100) substrate set forth in document 1, and to have the MgO (100) single crystal substrate of the invention set forth in document 3 serve as a substrate.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Front page

H01L43/08 (2006.01) , H01L43/10 (2006.01)

Supplemental Box

Continued from Box I.2

With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

The description:

Pages 9/1, 10, 10/1, 11, 11/1, 12, 12/1, 13, 13/1, 14, 14/1, 15, 15/1, 16, 17, 18, 21 received by this Authority on 13 September 2005

The claims:

Nos. 20, 23-25, 27, 30-32, 34 as original filed/furnished
Nos. 21, 22, 26, 28, 29, 33 received by this Authority on
13 September 2005